

In the Claims

Claim 1. (Currently amended) A polymerizable adhesive or filling composition for large assemblies comprising from about 5 to about 75 percent, by weight, of a thermoplastic or partially thermoplastic polymer or elastomer, from about 0.5 to about 35 percent, by weight, of an unsaturated polyester resin or vinyl ester resin selected from a group consisting of
1) orthophthalic, isophthalic, terephthalic, dicyclopentadiene,
or halogenated polyester resins and mixtures thereof,
2) flexibilized, low-to medium reactivity orthophthalic,
isophthalic or terephthalic resins and mixtures thereof, and
3) vinyl ester resins, said vinyl ester resins comprising
(a) the reaction product of a bisphenol A epoxy resin with
methacrylic acid,
(b) a mixture of (a) with a monomer or mixture of
monomers, and
(c) a mixture of (a) with a polyester resin, and mixtures
thereof, and about 20 to about 80 percent of an alkyl acrylate or methacrylate monomer, wherein ~~at least one~~ the thermoplastic or partially thermoplastic polymer or elastomer is crosslinked or partially crosslinked.

Claim 2. (Currently amended) A polymerizable adhesive or filling composition for large assemblies comprising from about

10 to about 60 percent by weight of a thermoplastic or partially thermoplastic polymer or elastomer, from about 1 to about 25 percent by weight of an unsaturated polyester resin or vinyl ester resin selected from a group consisting of

1) orthophthalic, isophthalic, terephthalic, dicyclopentadiene, or halogenated polyester resins and mixtures thereof,

2) flexibilized, low-to medium reactivity orthophthalic, isophthalic or terephthalic resins and mixtures thereof, and

3) vinyl ester resins, said vinyl ester resins comprising

(a) the reaction product of a bisphenol A epoxy resin with methacrylic acid,

(b) a mixture of (a) with a monomer or mixture of monomers, and

(c) a mixture of (a) with a polyester resin, and mixtures thereof, and about 30 to about 80 percent of an alkyl acrylate or methacrylate monomer, wherein ~~at least one~~ the thermoplastic or partially thermoplastic polymer or elastomer is crosslinked or partially crosslinked.

Claim 3. (Currently amended) A polymerizable adhesive or filling composition for large assemblies comprising from about 15 to about 50 percent by weight of a thermoplastic or partially thermoplastic polymer or elastomer, from about 2 to

about 20 percent by weight of an unsaturated polyester resin or vinyl ester resin selected from a group consisting of

- 1) orthophthalic, isophthalic, terephthalic, dicyclopentadiene, or halogenated polyester resins and mixtures thereof,
- 2) flexibilized, low-to medium reactivity orthophthalic, isophthalic or terephthalic resins and mixtures thereof, and
- 3) vinyl ester resins, said vinyl ester resins comprising
 - (a) the reaction product of a bisphenol A epoxy resin with methacrylic acid,
 - (b) a mixture of (a) with a monomer or mixture of monomers, and
 - (c) a mixture of (a) with a polyester resin, and mixtures thereof,

and about 40 to about 70 percent of an alkyl acrylate or methacrylate monomer, wherein ~~at least one~~ the thermoplastic or partially thermoplastic polymer or elastomer is crosslinked or partially crosslinked.

Claim 4. (Original) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic or partially thermoplastic polymer comprises a core-shell polymer or impact modifier.

Claim 5. (Original) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic or partially

thermoplastic polymer comprises a thermoplastic resin or mixtures of resins.

Claim 6. (Original) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic or partially thermoplastic polymer comprises an elastomer or mixture of elastomers and a core-shell polymer or impact modifier.

Claim 7. (Previously presented) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic or partially thermoplastic polymer or elastomer is selected from the group consisting of a nitrile elastomer, a liquid nitrile polymer, a chlorinated polymer or elastomer, a polymer or copolymer of chloroprene, chlorinated polyethylene, chlorosulfonated polyethylene, epichlorohydrin polymers, polymers and copolymers of butadiene, isoprene and ethylene-propylene and ethylene-butylene with acrylonitrile and styrene, an acrylate or methacrylate polymer or copolymer, and mixtures of the above.

Claim 8. (Previously presented) The polymerizable adhesive or filling composition of Claim 4 further comprising a thermoplastic or partially thermoplastic polymer or elastomer selected from the group consisting of a nitrile elastomer, a

liquid nitrile polymer, a chlorinated polymer or elastomer, a polymer or copolymer of chloroprene, chlorinated polyethylene, chlorosulfonated polyethylene, epichlorohydrine polymers, polymers and copolymers of butadiene, isoprene and ethylene-propylene and ethylene-butylene with acrylonitrile and styrene, an acrylate or methacrylate polymer or copolymer, and mixtures of the above.

Claim 9. (Cancelled)

Claim 10. (Original) The polymerizable adhesive or filling composition of Claim 1 wherein the alkyl acrylate or methacrylate monomers comprise a C1-C6 acrylate or methacrylate monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, hydroxyethyl methacrylate, propyl methacrylate, hydroxypropyl methacrylate, butyl methacrylate, hexamethyl methacrylate, hexyl methacrylate, cyclohexyl methacrylate, methyl acrylate, ethyl acrylate, hydroxyethyl acrylate, propyl acrylate, hydroxypropyl acrylate, butyl acrylate, hexyl acrylate, cyclohexyl methacrylate, or mixtures thereof.

Claim 11. (Original) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic or partially thermoplastic polymer is selected from the group consisting of

a blend of two or more thermoplastic or partially thermoplastic polymers, a blend of two or more elastomers, or at least one elastomer and at least one thermoplastic or partially thermoplastic polymer or mixtures thereof.

Claim 12. (Original) The polymerizable adhesive or filling composition of Claim 4 wherein the core-shell polymer or impact modifier is selected from the group consisting of ABS, MABS, MBS, and or all-acrylic and mixtures thereof.

Claim 13. (Previously presented) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic polymer is selected from the group consisting of polystyrene and copolymers thereof, acrylic polymers and copolymers, polymers of acrylonitrile including styrene/acrylonitrile, ABS, and MABS, chlorinated polymers including polyvinyl chloride polymers and copolymers and mixtures of the above.

Claim 14. (Previously presented) The polymerizable adhesive or filling composition of Claim 6 wherein the elastomer or mixture of elastomers is selected from the group consisting of soluble or lightly crosslinked polychloroprene, chlorinated polyethylene, chlorosulfonated polyethylene,

poly(epichlorohydrin), styrene-butadiene and styrene-isoprene polymers and block copolymers, soluble, lightly crosslinked or liquid polymers of acrylonitrile, butadiene and isoprene, acrylic elastomers, ethylene acrylic elastomers, and mixtures thereof.

Claim 15. (Previously presented) The polymerizable adhesive or filling composition of Claim 11 wherein the thermoplastic polymer is selected from the group consisting of polystyrene and copolymers thereof, acrylic polymers and copolymers, polymers of acrylonitrile including styrene/acrylonitrile, ABS, and MABS, chlorinated polymers including polyvinyl chloride polymers and copolymers and mixtures of the above.

Claim 16. (Previously presented) The polymerizable adhesive or filling composition of Claim 11 wherein the elastomer or mixture of elastomers is selected from the group consisting of soluble or lightly crosslinked polychloroprene, chlorinated polyethylene, chlorosulfonated polyethylene, poly(epichlorohydrin), styrene-butadiene and styrene-isoprene polymers and block copolymers, soluble, lightly crosslinked or liquid polymers of acrylonitrile, butadiene and isoprene,

acrylic elastomers, ethylene acrylic elastomers, and mixtures thereof.

Claim 17. (Cancelled)

Claim 18. (Original) The polymerizable adhesive or filling composition of Claim 1 further comprising from about 0.01 to about 20 percent by weight of a polymerizable organic acid monomer or oligomer.

Claim 19. (Original) The polymerizable adhesive or filling composition of Claim 18 wherein the polymerizable organic acid monomer comprises methacrylic acid or acrylic acid or mixtures thereof.

Claim 20. (Original) The polymerizable adhesive or filling composition of Claim 18 wherein the polymerizable organic acid monomer is selected from the group consisting of maleic acid, fumaric acid, itaconic acid and mixtures thereof.

Claim 21. (Original) The polymerizable adhesive or filling composition of Claim 18 wherein the polymerizable organic acid monomer or oligomer comprises a vinyl substituted phosphate ester.

Claim 22. (Original) The polymerizable adhesive or filling composition of Claim 1 further comprising from about 0.1 to about 10 percent by weight of a viscosity control agent.

Claim 23. (Original) The polymerizable adhesive or filling composition of Claim 1 further comprising one or more materials selected from the group consisting of catalysts, initiators, reducing agents, activators, and promoters and mixtures thereof.

Claim 24. (Original) The polymerizable adhesive or filling composition of Claim 1 further comprising a chlorosulfonated polymer, an organic sulfonyl chloride and a dihydropyridine.

Claim 25. (Original) The polymerizable adhesive or filling composition of Claim 1 further comprising a hydroperoxide, a dione or other chelator, an organometallic salt and an aromatic amine.

Claim 26. (Currently amended) The polymerizable adhesive or filling composition of Claim 1 wherein ~~at least one~~ the thermoplastic or partially thermoplastic polymer or elastomer is insoluble or only partially soluble in the monomer.

Claim 27. (Currently amended) The polymerizable adhesive or filling composition of Claim 1 wherein ~~at least one~~ the thermoplastic or partially thermoplastic polymer or elastomer provides ~~gel-like~~ gel properties in the composition prior to curing.

Claim 28. (Currently amended) The polymerizable adhesive or filling composition of Claim 1 wherein the thermoplastic or partially thermoplastic polymer or elastomer is selected from the group consisting of ~~diene-based~~ diene polymers or copolymers, ~~acrylic-based~~ acrylic polymers or copolymers and chlorinated polymers and mixtures thereof.

Claim 29. (Currently amended) A polymerizable adhesive or filling composition for large assemblies comprising from about 5 to about 75 percent, by weight, of a thermoplastic or partially thermoplastic polymer or elastomer, from about 0.5 to about 35 percent, by weight, of an unsaturated polyester resin or vinyl ester resin selected from a group consisting of
1) orthophthalic, isophthalic, terephthalic, dicyclopentadiene,
or halogenated polyester resins and mixtures thereof,
2) flexibilized, low-to medium reactivity orthophthalic,
isophthalic or terephthalic resins and mixtures thereof, and
3) vinyl ester resins, said vinyl ester resins comprising

(a) the reaction product of a bisphenol A epoxy resin with methacrylic acid,

(b) a mixture of (a) with a monomer or mixture of monomers, and

(c) a mixture of (a) with a polyester resin, and mixtures thereof, and about 20 to about 80 percent of an alkyl acrylate or methacrylate monomer, wherein ~~at least one~~ the thermoplastic or partially thermoplastic polymer or elastomer is crosslinked or partially crosslinked, wherein at least one thermoplastic or partially thermoplastic polymer or elastomer is insoluble or only partially soluble in the monomer, wherein at least one thermoplastic or partially thermoplastic polymer or elastomer provides ~~gel-like~~ gel properties in the composition prior to curing, and wherein the thermoplastic or partially thermoplastic polymer or elastomer is selected from the group consisting of ~~diene-based~~ diene polymers or copolymers, ~~acrylic-based~~ acrylic polymers or copolymers and chlorinated polymers and mixtures thereof.

Claim 30. (New) The polymerizable adhesive or filling composition for large assemblies of Claim 1, wherein the polyester resin or vinyl ester resin is selected from the group consisting of vinyl ester resins, chlorinated polyester resins and resins based on dicyclopentadiene resins and mixtures thereof.

Claim 31. (New) The polymerizable adhesive or filling composition for large assemblies of Claim 2, wherein the polyester resin or vinyl ester resin is selected from the group consisting of vinyl ester resins, chlorinated polyester resins and resins based on dicyclopentadiene resins and mixtures thereof.

Claim 32. (New) The polymerizable adhesive or filling composition for large assemblies of Claim 3, wherein the polyester resin or vinyl ester resin is selected from the group consisting of vinyl ester resins, chlorinated polyester resins and resins based on dicyclopentadiene resins and mixtures thereof.

Claim 33. (New) The polymerizable adhesive or filling composition for large assemblies of Claim 29, wherein the polyester resin or vinyl ester resin is selected from the group consisting of vinyl ester resins, chlorinated polyester resins and resins based on dicyclopentadiene resins and mixtures thereof.

Discussion of Amendments to the Claims

The applicants have amended Claims 1, 2, 3, 26, 27 and 29 to delete the phrase, "at least one", and replace it with "the", as suggested by the Examiner on p.4, second para. of the Office Action.

The applicants have also amended Claims 27 and 29 to delete the phrase, "gel-like", and replace it with "gel", as suggested by the Examiner on p.3, last para. of the Office Action.

The applicants have also amended Claims 28 and 29 to delete the phrases, "diene-based" and "acrylic-based", and replace them with the terms "diene" and "acrylic", as suggested by the Examiner on p.4, first para. of the Office Action.

Each of these amendments were made in response to indefiniteness rejections under 35 USC §112 on pages 3 and 4 of the Office Action.

The applicants have also amended each of the independent claims, Claims 1, 2, 3, and 29, to provide a specific limitation on the types of polyester resins and vinyl ester resins that are claimed in each of the independent claims. Support for these amendments is contained on p. 17, lines 8 - 12; p. 18, line 3 through p. 19, line 5; and p. 20, lines 9 - 21.

New Claims 30 - 33 have been added. In these new claims the applicants have narrowed further the definition of the unsaturated polyester resins and vinyl ester resins that are claimed to three particular groups of resins: vinyl ester resins, chlorinated polyester resins, and resins based on dicyclopentadiene and mixtures thereof. Basis for this amendment is provided on p.18, lines 3 - 23.

No new subject matter is introduced by any of these amendments.

Discussion of Office Action dated April 12, 2006

The USPTO acknowledged that a number of rejections from an earlier Office Action were withdrawn, for which the applicants express their appreciation.

Rejections under 35 USC §112.

The USPTO rejected a number of the claims of the application as being indefinite or for failing to comply with the enablement requirement. The applicants have amended each of the claims that were rejected to put them in proper condition for allowance. The applicants request that these rejections be withdrawn.

Claim rejections under 35 USC 102.

The USPTO rejected substantially all of the claims of the application based on Gosiewski, et al., U.S. Patent No. 5,206,288. The USPTO also rejected substantially all claims of the application as being anticipated by Gosiewski, et al., U.S. Patent No. 5,945,461. Finally, the USPTO rejected substantially all claims of the application based on Zalucha, et al., U.S. Patent No. 4,293,665. The applicants respectfully traverse each of these rejections.

Rejections based on Gosiewski, et al., U.S. Patent No. 5,206,288 ("the '288 Patent") and Gosiewski, et al., U.S. Patent No. 5,945,461 ("the '461 Patent").

These patents disclose either adhesive compositions or a foamed acrylic polymer composition. However, the compositions disclosed are entirely different from the compositions of the application. Specifically, each of the Gosiewski, et al. patents fails to disclose the use of any polyester resin or vinyl ester resin, which is one of the key components of each claim of the application. Note in the '288 Patent that there is no disclosure of the use of any polyester or vinyl ester resin.

Further, the '461 Patent actually teaches away from the use of polyester or vinyl ester resins. At col. 6, lines 47 - 58, the '461 Patent states that their compositions have a number of particular applications. However, the '461 Patent then states

In general, the instant compositions provide the greatest advantage in applications that currently use semi-rigid or flexible, two-part polyurethane, epoxy or polyester resins.

Thus, the compositions of the '461 Patent are contrasted with various other compositions, such as a two part system containing various components including a polyester resin.

In addition, at col. 7, lines 31 - 38, the '461 Patent states,

Epoxide resin and catalyzed polyester/styrene foams address some of these issues, but because of their relatively poor cell structures and physical properties, the foams have limited usage relative to polyurethanes. In fact, aside from the compositions of the present invention, no class of thermoplastic or thermoset resins have provided the range of hardness, elasticity, and overall excellent foam properties of the polyurethanes. (Emphasis supplied.)

Clearly neither the '288 Patent nor the '461 Patent disclose the use of any polyester or vinyl ester resins and the '461 Patent teaches away from such use.

U.S. Patent No. 4,293,665 (the '665 Patent).

In contrast to the two Gosiewski, et al. patents, the '665 Patent provides a very limited disclosure of certain types of heavily unsaturated, polyester resins containing relatively large numbers of double bonds. The particular resins disclosed in the '665 Patent are discussed at col. 7, lines 24 - 38. Examples of one of these unsaturated polyester resins is disclosed in Example VI of the '665 Patent.

In order to overcome the disclosure of the '665 Patent, the applicants have amended all claims of the application to select specific polyester resins and vinyl ester resins which are not disclosed in the '665 Patent and which function well in the composition of their application. Further, dependent Claims 30 -33 specifically claim vinyl ester resins, chlorinated

polyester resins, and resins based on dicyclopentadiene resins, none of which are disclosed or suggested by the '665 Patent.

The applicants respectfully assert that the specific polyester and vinyl ester resins that are now claimed in the independent claims of the application are distinctive from the limited disclosure of polyester resins in the '665 Patent.

The applicants also respectfully assert that there is no disclosure or suggestion of the use of vinyl ester resins, chlorinated polyester resins or resins based on dicyclopentadiene resins or mixtures thereof in the '665 Patent as claimed in new Claims 30 - 33.

Accordingly, the applicants respectfully assert that each of the cited references fails to disclose the invention as new claimed in the amended claims of the application.